

ABB component drives

ACS100, 0.12 to 2.2 kW

ABB general machinery drives

ACS140, 0.12 to 2.2 kW

ABB decentralized drives

ACS160, 0.55 to 2.2 kW

Technical Catalogue



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Features and selection guide

	200-240 V 0.12-2.2 kW	200-480 V 0.12-2.2 kW	380-480 V 0.55-2.2 kW
	ACS100	ACS140	ACS160
Functions			
Start; normal/flying/torque boost		■	■
Start; premagnetising		■	■
IR compensation	■	■	■
Stop; ramp/coasting	■	■	■
Stop; DC brake	■	■	■
DC hold	■	■	■
U/f -ratio; linear/square	■	■	■
Acceleration/deceleration 1 (s)	0.1 ... 1800	0.1 ... 1800	0.1 ... 1800
Acceleration/deceleration 2 (s)		0.1 ... 1800	0.1 ... 1800
S-ramp; fast/medium/slow	■	■	■
Preset speeds ¹⁾	■ 1	■ 7	■ 7
Critical frequencies ¹⁾		■ 2	■ 2
Slip compensation		■	■
Application macros			
Factory	■	■	■
ABB Standard	■	■	■
3-wire	■	■	■
Alternate	■	■	■
Motor potentiometer		■	■
Hand/Auto Control		■	■
PID Control (process)		■	■
Premagnetise		■	■
Pump and Fan Control (PFC)			
Positioning			■
Protection, fault functions			
Overload protection	■	■	■
Stall protection		■	■
Output overcurrent	■	■	■
Output short circuit	■	■	■
Ground fault, motor cable	■	■	■
Underload			■
Network failure	■	■	■
Low input signal level (AI<min)	■	■	■
Panel fault	■	■	■
Overvoltage	■	■	■
Undervoltage	■	■	■
External fault		■	■
Automatic fault reset, undervoltage	■	■	■
Automatic fault reset, overvoltage, overcurrent, AI<min		■	■
Fault history ¹⁾	■ 1	■ 3	■ 3
Supervision functions (programmable)²⁾			
Speed		■	■
Current		■	■
Torque		■	■
Output power		■	■
Reference setpoint		■	■

¹⁾ The number indicates the amount of different speeds / frequencies / faults.

²⁾ Many other signals can also be monitored, see the user's manual.

■ standard feature

Application macros

What are application macros?

A wide selection of pre-set application macros have been created to ensure fast and easy commissioning of all ABB low voltage AC drives.

With application macros you can set up your drive extremely fast for all the most common applications. And of course you can fine tune the drive operation by changing the pre-set parameters if needed.

By changing only one parameter all the drive's macro-specific parameters are automatically set with new pre-set values. The drive's I/O-terminals are also automatically configured to meet the demands set by your application.

All the application macros which can be used with ACS100, ACS140 and ACS160 drives are listed below together with explanations.

The **Factory** application macro is intended for applications where the drive is used without a control panel, providing a general purpose I/O-configuration.

The **ABB Standard** (typically used in Europe) and the **3-wire** (typically used in the United States) application macros are configured for general purpose applications, and offer two additional pre-set speeds compared to the factory application macro.

The **Alternate** application macro has an I/O-configuration adopted to a sequence of DI-control signals used when alternating the direction of the drive.

The **Motor Potentiometer** application macro provides a cost-effective interface for PLCs that vary the speed of the drive using only digital signals.

The **Hand/Auto** application macro offers an I/O-configuration typically used in HVAC applications.

The **PID Control** application macro is intended for use with closed-loop control systems such as pressure and flow control.

The **Premagnetise** application macro enables rapid starting by eliminating the delay normally experienced while flux builds up in the motor.

The **Positioning** application macro is for simple positioning tasks. Default operation is appropriate for example for conveyer systems where items are moved a certain distance.

ACS100



ACS140



ACS160



ABB component drives, ACS100

0.12 kW - 2.2 kW supply voltage 200 - 240 V

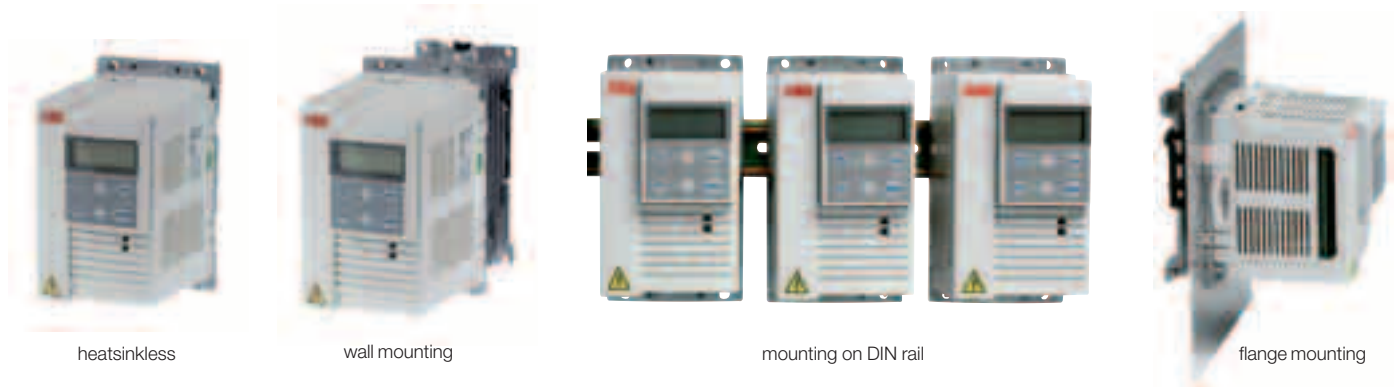
Unique features

- The plug and produce construction
- Easy and simple to use
- Many installation possibilities

More value for money

- Parameter copy
- Wide range of protection
- Fast and accurate control
- Fast and accurate I/O response
- Cost optimization without the panel

Mounting options



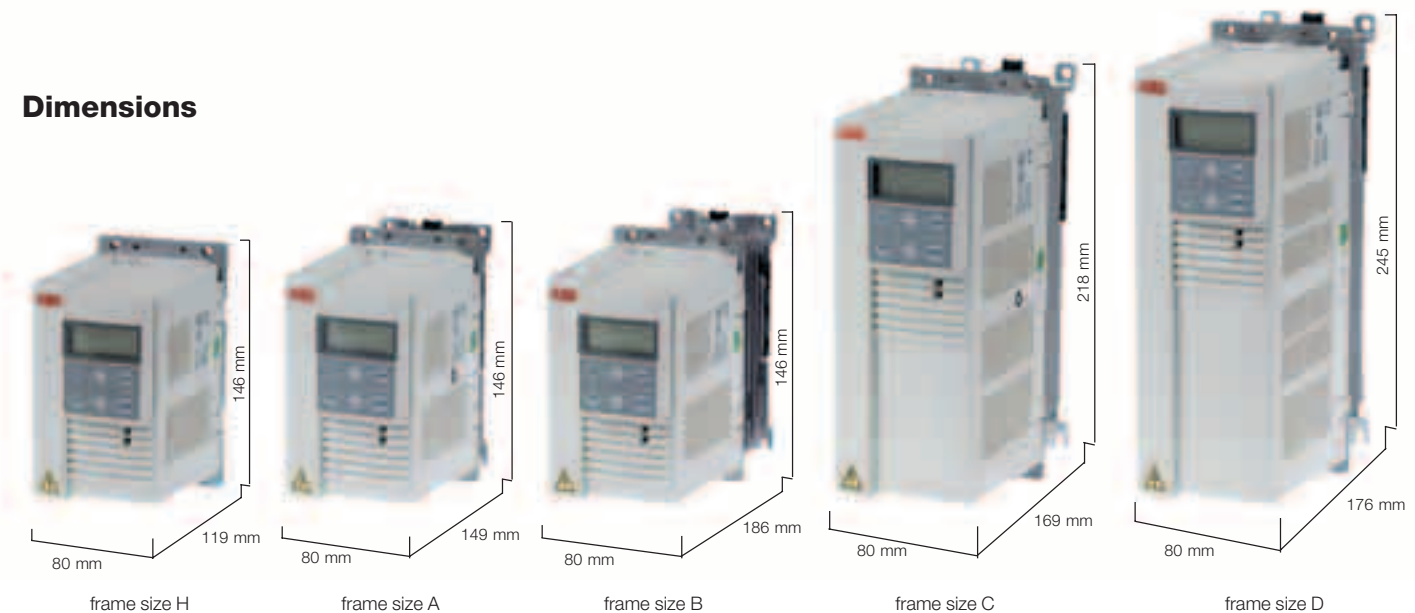
Mounting options

In addition to the conventional wall mounting and time-saving DIN rail mounting, the ACS100 also offers flange-mounting. The heatsink is located outside the enclosure and hence the major share of the power loss is external to the enclosure.

Heatsinkless

In cases where space is a limitation, drives without a heatsink can be delivered as standard. The user has to provide an installation surface with sufficient cooling. For more information, please refer to the ACS100 User's Manual.

Dimensions



ACS100 technical specification

Mains connection

Power range: 0.12 - 2.2 kW

Voltage: 1-phase and 3-phase, 200 to 240 V, $\pm 10\%$

Frequency: 48 to 63 Hz

Power Factor: 0.98

Use 60°C rated power cable (75°C if T_{amb} above 45°C).

Max. wire sizes (mm²)

- 4 single core/torque 0.8 Nm

Motor connection

Voltage: 3-phase, from 0 to U_{SUPPLY}

Frequency: 0 to 300 Hz

Continuous loading capability (constant torque at a max. ambient temperature of 40°C): Rated output current I_{2N} .

Overload capacity (at a max. ambient temp. of 40°C):

- at constant torque $1.5 \times I_{2N}$, for 1 minute every 10 minutes
- at constant torque $1.25 \times I_{2N}$, for 2 minutes every 10 minutes

Characteristic data for short-time, intermittent and periodic load cycles are available on request.

Switching frequency:

Standard 4 kHz, Low-noise 8 kHz, Silent 16 kHz

Acceleration time: 0.1 to 1800 s

Deceleration time: 0.1 to 1800 s

For max. motor cable lengths see p. 11.

Programmable control connections

Max. wire sizes (mm²)

- 0.5-1.5 (AWG 22...AWG 16)/torque 0.4 Nm

One analog input:

- Voltage signal: 0 (2) to 10 V, 200 k Ω single-ended
- Current signal: 0 (4) to 20 mA, 500 Ω single-ended
- Potentiometer reference value:
10 V $\pm 2\%$ max. 10 mA, 1 k $\Omega \leq R \leq 10$ k Ω
- Response time: ≤ 60 ms
- Resolution: 0.1%
- Accuracy: $\pm 1\%$

Auxiliary voltage: 12 V DC, max. 100 mA

Three digital inputs:

- 12 V DC with internal or 12 V ... 24 V DC with external supply, PNP and NPN
- Input impedance: 1.5 k Ω
- Response time: ≤ 9 ms

One fault relay:

- Switching voltage: 12 to 250 V AC or max 30 V DC/0.5 A
- Maximum continuous current: 10 mA to 2 A

Serial communication for the control panel:

Modbus protocol

Protection limits

Overvoltage

- Running V DC: 420 (corr. to 295 V input)
- Start inhibit V DC: 390 (corr. to 276 V input)

Undervoltage

- Running V DC: 200 (corr. to 142 V input)
- Start inhibit V DC: 230 (corr. to 162 V input)

Environmental limits

Ambient temperatures:

- Output current = I_2 , $f_{switch} = 4$ kHz: 0 to 40°C
- Output current = $0.8 \cdot I_2$, $f_{switch} = 4$ kHz: 40 to 50°C
- Output current = I_2 , $f_{switch} = 8$ kHz: 0 to 30°C
- Output current = $0.9 \cdot I_2$, $f_{switch} = 8$ kHz: 30 to 40°C
- Output current = $0.75 \cdot I_2$, $f_{switch} = 16$ kHz: 0 to 30°C

Altitude:

- Output current = I_2 : 0 to 1000 m
- Output current reduced by 1% per 100 m over 1000 m to 2000 m

Relative humidity: lower than 95%

(without condensation)

Protection class: IP 20

Paint colour: NCS 1502-Y, RAL 9002, PMS 420 C

Contamination levels: no conductive dust, corrosive liquids or gases (IEC 721-3-3).

Product compliance

- Low Voltage Directive 73/23/EEC with supplements
- EMC Directive 89/336/EEC with supplements
- Quality assurance system ISO 9001 and ISO 14001
- CE, UL, ULc and C-Tick approvals

Options

- Control panel
- Extension cable 3 m with IP 65 Kit for control panels PEC-98-0008
- EMC IP 20 input filters
- Brake units and choppers
- Input and output chokes
- NEMA 1/ IP 21 Installation kits

ACS100 technical data

Type code	Nominal motor P _N ²⁾ kW	Nominal ratings			Max. output current A	Over-current (peak) A	Over-temp. (heat sink) °C	Line fuse ¹⁾ A	Power losses	
		Frame size/ weight kg	Input current I _{1N} A	Output current I _{2N} A					Power circuit W	Control circuit W
With heatsink, 1-phase supply voltage 200 - 240 V ±10%, 0.12 - 2.2 kW										
ACS101-K18-1	0.12	A/0.9	2.7	1.0	1.5	3.2	90	6	7	8
ACS101-K25-1	0.18	A/0.9	4.4	1.4	2.1	4.5	90	6	10	10
ACS101-K37-1	0.25	A/0.9	5.4	1.7	2.6	5.5	90	10	12	12
ACS101-K75-1	0.37	A/0.9	6.9	2.2	3.3	7.1	90	10	13	14
ACS101-1K1-1	0.55	A/0.9	9.0	3.0	4.5	9.7	90	10	19	16
ACS101-1K6-1	0.75	B/1.2	10.8	4.3	6.5	13.8	90	16	27	17
ACS101-2K1-1	1.1	C/1.6	14.8	5.9	8.9	19.0	95	16	39	18
ACS101-2K7-1	1.5	C/1.6	18.2	7.0	10.5	23.5	95	20	48	19
ACS101-4K1-1	2.2	D/1.9	22.0	9.0	13.5	34.5	95	25	70	20
Heatsinkless, 1-phase supply voltage 200 - 240 V ±10%, 0.12 - 2.2 kW										
ACS101-H18-1	0.12	H/0.8	2.7	1.0	1.5	3.2	90	6	7	8
ACS101-H25-1	0.18	H/0.8	4.4	1.4	2.1	4.5	90	6	10	10
ACS101-H37-1	0.25	H/0.8	5.4	1.7	2.6	5.5	90	10	12	12
ACS101-H75-1	0.37	H/0.8	6.9	2.2	3.3	7.1	90	10	13	14
ACS101-1H1-1	0.55	H/0.8	9.0	3.0	4.5	9.7	90	10	19	16
ACS101-1H6-1	0.75	H/0.8	10.8	4.3	6.5	13.8	90	16	27	17
With heatsink, 3-phase supply voltage 200 - 240 V ±10%, 0.12 - 2.2 kW										
ACS103-K75-1	0.37	A/0.8	3.2	2.2	3.3	7.1	90	6	13	14
ACS103-1K1-1	0.55	A/0.8	4.2	3.0	4.5	9.7	90	6	19	16
ACS103-1K6-1	0.75	B/1.1	5.3	4.3	6.5	13.8	90	6	27	17
ACS103-2K1-1	1.1	C/1.5	7.2	5.9	8.9	19.0	90	10	39	18
ACS103-2K7-1	1.5	C/1.5	8.9	7.0	10.5	23.5	95	10	48	19
ACS103-4K1-1	2.2	D/1.8	12.0	9.0	13.5	34.5	95	16	70	20

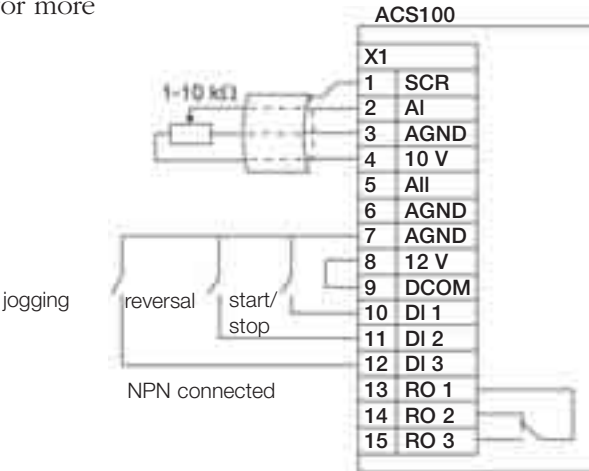
¹⁾ Fuse type: UL class CC or T. For non-UL installations IEC269 gG.

²⁾ P_N rated motor power. The power ratings in kW apply to most 2- and 4-pole IEC 34 motors.
The current ratings are the same regardless of supply voltages. The rated current of the ACS100 drive must be higher than or equal to the rated motor current to achieve the rated motor power given in the table.

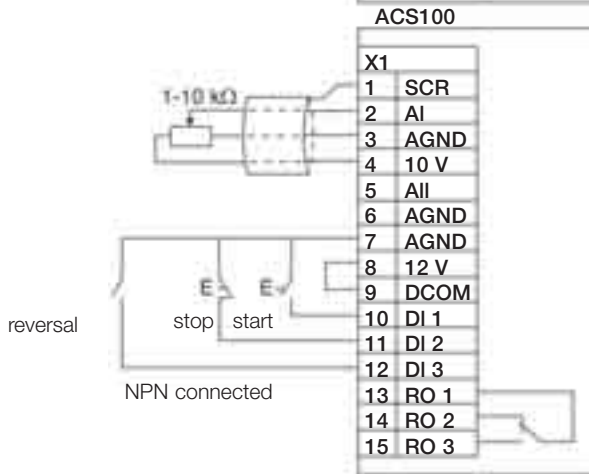
ACS100 connection examples

These connections are shown as examples only.
Please refer to the ACS100 User's Manual for more
detailed information.

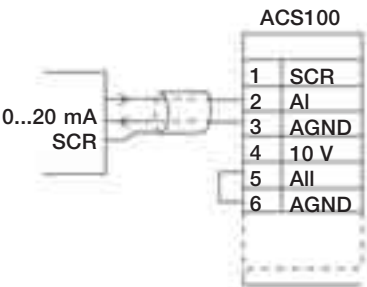
DI configuration ABB standard



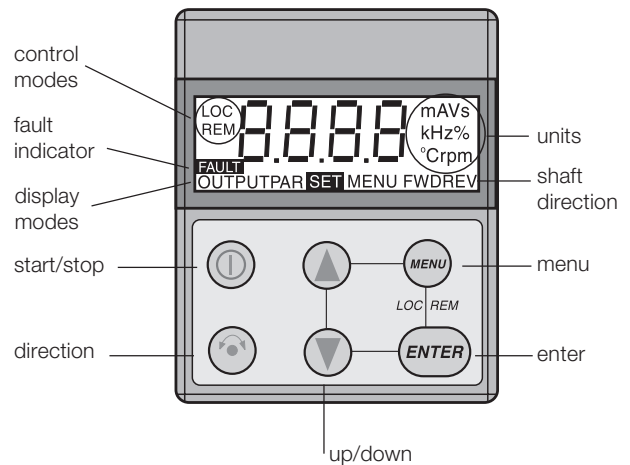
DI configuration 3-wire



Frequency reference value from an external current source



ACS100 options



Control panel

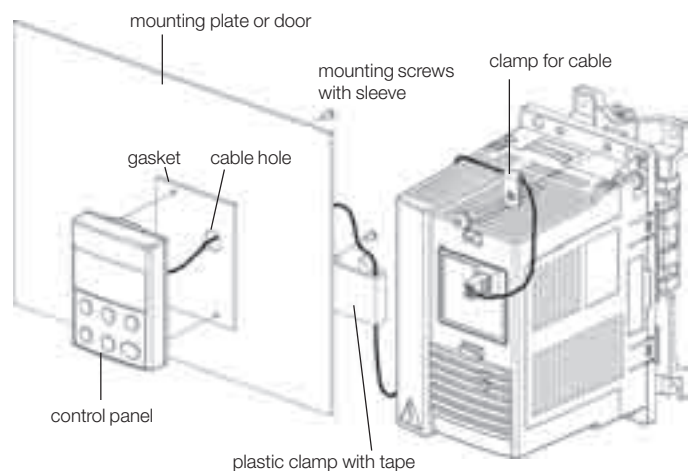
Type code: ACS100 - PAN

ACS100 drives can be bought with or without a detachable control panel. If you prefer to buy the drive without the control panel we still offer you a chance to have the panel as an option. Using the control panel, parameters can be exchanged between two ACS100 drives. This is called parameter upload/download procedure.

Panel extension cable kit

Type code: PEC-98-0008

This option includes a gasket, a 3 m connection cable for control panels, fixing material for the cables and a drilling jig. With this kit IP 65 protection class is achieved.



ACS100 options

EMC filters

Instructions to comply with EN61800-3:

To comply with:

- **1st Environment, unrestricted** distribution, please contact your ABB distributor.
- **1st Environment, restricted** distribution, always use optional RFI filter as specified in the table below.

To comply with:

- **2nd Environment, unrestricted** distribution, always use optional RFI filter as specified in the table below
- **2nd Environment, restricted** distribution, always use optional RFI filter as specified in the table below. If RFI filters are to be avoided, an EMC plan has to be created between the customer and the sales person.

1-phase supply voltage 200 - 240 V, 0.12 - 2.2 kW

Type code	Filter type	Max. motor cable length m							Dimensions			
		Switching frequency						A mm	B mm	C mm	D mm	
		1 st environment			2 nd environment							
		4 kHz	8 kHz	16 kHz	4 kHz	8 kHz	16 kHz					
ACS101-K18-1, -H18-1	ACS100/140-IFAB-1	30	20	10	50	50	10	81	186	191	42	
ACS101-K25-1, -H25-1	ACS100/140-IFAB-1	30	20	10	50	50	10	81	186	191	42	
ACS101-K37-1, -H37-1	ACS100/140-IFAB-1	30	20	10	50	50	10	81	186	191	42	
ACS101-K75-1, -H75-1	ACS100/140-IFAB-1	30	20	10	75	75	10	81	186	191	42	
ACS101-1K1-1, -1H1-1	ACS100/140-IFAB-1	30	20	10	75	75	10	81	186	191	42	
ACS101-1K6-1, -1H6-1	ACS100/140-IFAB-1	30	20	10	75	75	10	81	186	228	42	
ACS101-2K1-1	ACS100/140-IFCD-1	30	20	10	75	75	10	81	286	211	42	
ACS101-2K7-1	ACS100/140-IFCD-1	30	20	10	75	75	10	81	286	211	42	
ACS101-4K1-1	ACS100/140-IFCD-1	30	20	10	75	75	10	81	286	218	42	

RFI filter type code ACS100 -FLT-C allows you to use longer motor cables.
Please contact your ABB distributor. IFAB, IFCD and FLT-C filters with protection class IP 20.

Note! With types ACS...H mount the filter next to the drive.

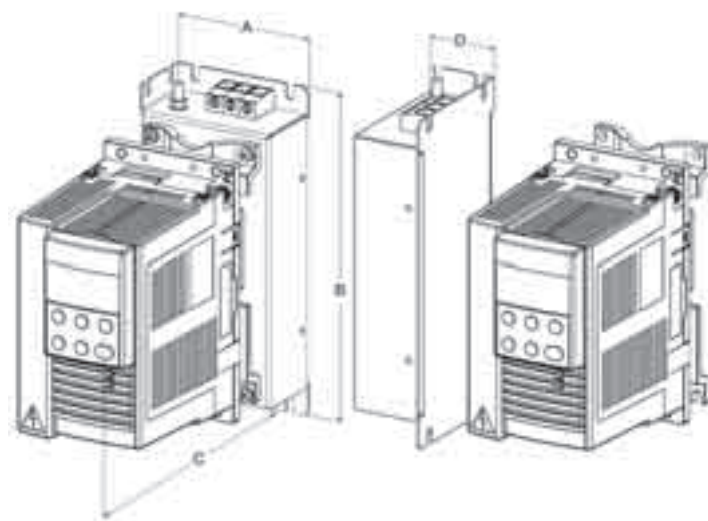
3-phase supply voltage 200 - 240 V, 0.37 - 2.2 kW

Use EMC filter type ACS140-FLT-C with all ACS103-xKx-1 converter types. Maximum motor cable length is 100 m in 1st Environment, restricted distribution with 4 kHz and 8 kHz switching frequency. For ACS103-4K1-1 with EMC filter the maximum continuous load is 70% of nominal.

NEMA 1/ IP 21 installation kit

Type code: NEMA 1/ IP 21

With this installation kit NEMA 1/ IP 21 protection class is achieved for ACS100 and for the EMC filter, if the filter is attached directly to the drive.



ACS100 options

Input and output chokes

Output chokes are used when motor cables above normal length are required. This is possible because the output choke reduces capacitive currents and voltage reflections. The maximum switching frequency with output chokes is 4 kHz. Please note also your local EMC regulations.

Optional input chokes can be used with the ACS100 in case voltage fluctuation problems occur in the supply net. The chokes eliminate converter trips caused by overvoltage spikes. At the same time chokes reduce line harmonics and therefore help to prevent other sensitive equipment in the same net from tripping.

Type code	Choke type		Max. motor cable length	
	Input choke	Output choke	with choke ¹⁾ m	without choke ¹⁾ m
1-phase supply voltage 200 - 240 V, 0.12 - 2.2 kW				
ACS101-K18-1	SACL21	ACS-CHK-B3	75	50
ACS101-K25-1	SACL21	ACS-CHK-B3	75	50
ACS101-K37-1	SACL21	ACS-CHK-B3	75	50
ACS101-K75-1	SACL21	ACS-CHK-B3	110	75
ACS101-1K1-1	SACL21	ACS-CHK-B3	110	75
ACS101-1K6-1	SACL22	ACS-CHK-B3	110	75
ACS101-2K1-1	SACL22	ACS-CHK-C3	110	75
ACS101-2K7-1	SACL23	ACS-CHK-C3	110	75
ACS101-4K1-1	SACL24	ACS-CHK-C3	110	75
3-phase supply voltage 200 - 240 V, 0.37 - 2.2 kW				
ACS103-K75-1	ACS-CHK-B3	ACS-CHK-B3	110	75
ACS103-1K1-1	ACS-CHK-B3	ACS-CHK-B3	110	75
ACS103-1K6-1	ACS-CHK-B3	ACS-CHK-B3	110	75
ACS103-2K1-1	ACS-CHK-B3	ACS-CHK-C3	110	75
ACS103-2K7-1	ACS-CHK-C3	ACS-CHK-C3	110	75
ACS103-4K1-1	ACS-CHK-C3	ACS-CHK-C3	110	75
1-phase supply voltage 200 - 240 V, 0.12 - 0.75 kW / heatsinkless				
ACS101-H18-1	SACL21	ACS-CHK-B3	75	50
ACS101-H25-1	SACL21	ACS-CHK-B3	75	50
ACS101-H37-1	SACL21	ACS-CHK-B3	75	50
ACS101-H75-1	SACL21	ACS-CHK-B3	110	75
ACS101-1H1-1	SACL21	ACS-CHK-C3	110	75
ACS101-1H6-1	SACL21	ACS-CHK-C3	110	75

¹⁾ Without EMC filter

Technical data

Choke type	L/mH	Dimensions H x W x D mm	Weight kg	Max. cable mm ²	I/A
ACS-CHK-B3	1.5	300x102x112	4.0	4	8.0
ACS-CHK-C3	0.8	300x102x112	4.0	4	14.0
SACL21	3.2	76x63x62	1.0	4	8.5
SACL22	1.5	92x76x63	1.3	10	15
SACL23	0.7	92x76x63	1.3	10	22
SACL24	0.7	92x76x63	1.9	6	28

Brake options

The ACS100 can be equipped with a brake unit.
For more information please refer to page 19 for the ACS100 brake options.

ABB general machinery drives, ACS140

0.12 kW - 2.2 kW supply voltage 200 - 480 V

Unique features

- Fast and extensive I/O
- PID control
- Application macros
- Many installation possibilities
- 200 - 480 V, 1-phase or 3-phase

More value for money

- Possibility to have IP 21 enclosure
- Very fast and accurate control
- Extremely good repeatability
- Cost optimization without the panel

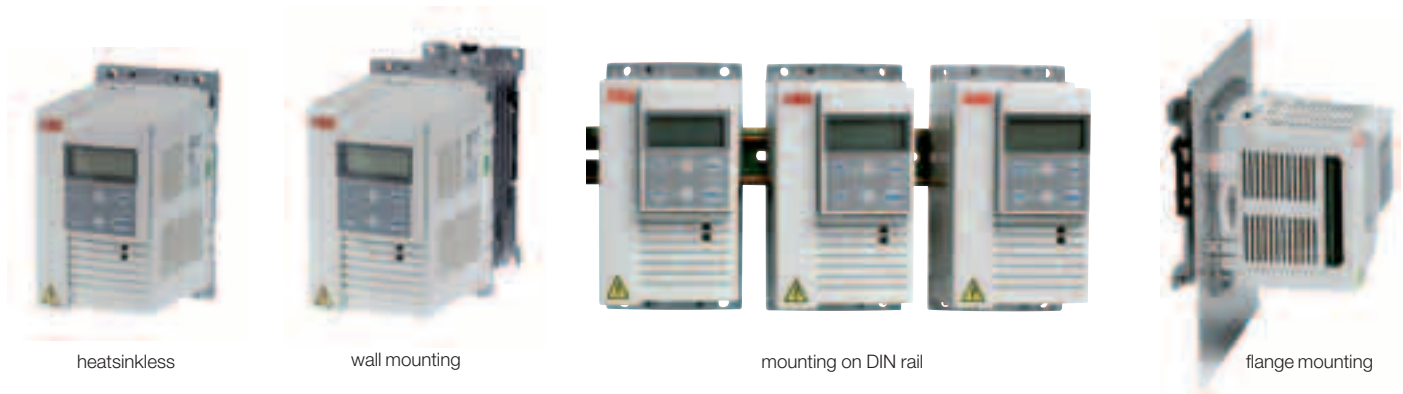
Mounting options

In addition to the conventional wall mounting and time-saving DIN rail mounting, ACS140 also offers flange-mounting. The heatsink is located outside the enclosure and hence the major share of the power loss is external to the enclosure.

Heatsinkless series

In cases where space is a limitation, drives without a heatsink can be delivered as standard. The user has to provide an installation surface with sufficient cooling. For more information, please refer to the ACS140 User's Manual.

Mounting options



Dimensions



ACS140 technical specification

Mains connection

Power range: 0.12 - 2.2 kW

Voltage: 1-phase and 3-phase, 200 to 240 V, $\pm 10\%$
3-phase, 380 to 480 V, $\pm 10\%$

Frequency: 48 to 63 Hz

Power Factor: 0.98

Use 60°C rated power cable (75°C if T_{amb} above 45°C).

Max. wire sizes (mm²)

- 4 single core/torque 0.8 Nm

Motor connection

Voltage: 3-phase, from 0 to U_{SUPPLY}

Frequency: 0 to 300 Hz

Continuous loading capability (constant torque at a max. ambient temperature of 40°C): Rated output current I_{2N} .

Overload capacity (at a max. ambient temp. of 40°C):

- at constant torque $1.5 \times I_{2N}$, for 1 minute every 10 minutes
- at constant torque $1.25 \times I_{2N}$, for 2 minutes every 10 minutes

Characteristic data for short-time, intermittent and periodic load cycles are available on request.

Switching frequency:

Standard 4 kHz, Low-noise 8 kHz, Silent 16 kHz

Acceleration time: 0.1 to 1800 s

Deceleration time: 0.1 to 1800 s

For max. motor cable lengths see p. 18.

Programmable control connections

Max. wire sizes (mm²)

- 0.5-1.5 (AWG 22...AWG 16)/torque 0.4 Nm

Two analog inputs:

- Voltage signal: 0 (2) to 10 V, 200 k Ω single-ended
- Current signal: 0 (4) to 20 mA, 500 Ω single-ended
- Potentiometer reference value:
10 V $\pm 2\%$ max. 10 mA, 1 k $\Omega \leq R \leq 10$ k Ω
- Response time: ≤ 60 ms
- Resolution: 0.1%
- Accuracy: $\pm 1\%$

One analog output: 0 (4) to 20 mA, load $< 500 \Omega$

Auxiliary voltage: 12 V DC, max. 100 mA

Five digital inputs:

- 12 V... 24 V DC with internal or external supply, PNP and NPN
- Input impedance: 1.5 k Ω
- Response time: ≤ 9 ms

Two relay outputs:

- Switching voltage: 12 to 250 V AC or max 30 V DC/0.5 A
- Maximum continuous current: 10 mA to 2 A

Serial communication for the control panel or external control: Modbus protocol

Protection limits

Overvoltage, 200 to 240 V units

- Running V DC: 420 (corr. to 295 V input)
- Start inhibit V DC: 390 (corr. to 276 V input)

Overvoltage, 380 to 480 V units

- Running V DC: 842 (corr. to 595 V input)
- Start inhibit V DC: 661 (corr. to 380 - 415 V input)
765 (corr. to 440 - 480 V input)

Undervoltage, 200 to 240 V units

- Running V DC: 200 (corr. to 142 V input)
- Start inhibit V DC: 230 (corr. to 162 V input)

Undervoltage, 380 to 480 V units

- Running V DC: 333 (corr. to 247 V input)
- Start inhibit V DC: 436 (corr. to 380 - 415 V input)
505 (corr. to 440 - 480 V input)

Environmental limits

Ambient temperatures:

- Output current = I_2 , $f_{switch} = 4$ kHz: 0 to 40°C
- Output current = $0.8 \cdot I_2$, $f_{switch} = 4$ kHz: 40 to 50°C
- Output current = I_2 , $f_{switch} = 8$ kHz: 0 to 30°C
- Output current = $0.9 \cdot I_2$, $f_{switch} = 8$ kHz: 30 to 40°C
- Output current = $0.75 \cdot I_2$, $f_{switch} = 16$ kHz: 0 to 30°C¹⁾

Altitude:

- Output current = I_2 : 0 to 1000 m
- Output current reduced by 1% per 100 m over 1000 m to 2000 m

Relative humidity: lower than 95% (without condensation)

Protection class: IP 20

Paint colour: NCS 1502-Y, RAL 9002, PMS 420 C

Contamination levels: no conductive dust, corrosive liquids or gases (IEC 721-3-3).

Product compliance

- Low Voltage Directive 73/23/EEC with supplements
- EMC Directive 89/336/EEC with supplements
- Quality assurance system ISO 9001 and ISO 14001
- CE, UL, ULc and C-Tick approvals

Options

- Control panel
- RS 485/232 adapter
- DriveWindow Light 2
- Extension cable 3 m with IP 65 Kit for control panels PEC-98-0008
- EMC IP 20 input filters
- Brake units and choppers
- Input and output chokes
- NEMA 1/ IP 21 Installation kits
- Fieldbus modules

¹⁾ Except ACS143-1K1-3 and ACS143-2K1-3 where output current = $0.55 \times I_2$, $f_{SWITCH} = 16$ kHz: 0 to 30°C.

ACS140 technical data

Type code	Nominal motor P _N ²⁾ kW	Nominal ratings			Max. output current A	Over- current (peak) A	Over- temp. (heat sink) °C	Line fuse ¹⁾ A	Power losses	
		Frame size/ weight kg	Input current I _{1N} A	Output current I _{2N} A					Power circuit W	Control circuit W
With heatsink, 1-phase supply voltage 200 - 240 V ±10%, 0.12 - 2.2 kW										
ACS141-K18-1	0.12	A/0.9	2.7	1.0	1.5	3.2	90	6	7	8
ACS141-K25-1	0.18	A/0.9	4.4	1.4	2.1	4.5	90	6	10	10
ACS141-K37-1	0.25	A/0.9	5.4	1.7	2.6	5.5	90	10	12	12
ACS141-K75-1	0.37	A/0.9	6.9	2.2	3.3	7.1	90	10	13	14
ACS141-1K1-1	0.55	A/0.9	9.0	3.0	4.5	9.7	90	10	19	16
ACS141-1K6-1	0.75	B/1.2	10.8	4.3	6.5	13.8	90	16	27	17
ACS141-2K1-1	1.1	C/1.6	14.8	5.9	8.9	19.0	95	16	39	18
ACS141-2K7-1	1.5	C/1.6	18.2	7.0	10.5	23.5	95	20	48	19
ACS141-4K1-1	2.2	D/1.9	22.0	9.0	13.5	34.5	95	25	70	20
Heatsinkless, 1-phase supply voltage 200 - 240 V ±10%, 0.12 - 2.2 kW										
ACS141-H18-1	0.12	H/0.8	2.7	1.0	1.5	3.2	90	6	7	8
ACS141-H25-1	0.18	H/0.8	4.4	1.4	2.1	4.5	90	6	10	10
ACS141-H37-1	0.25	H/0.8	5.4	1.7	2.6	5.5	90	10	12	12
ACS141-H75-1	0.37	H/0.8	6.9	2.2	3.3	7.1	90	10	13	14
ACS141-1H1-1	0.55	H/0.8	9.0	3.0	4.5	9.7	90	10	19	16
ACS141-1H6-1	0.75	H/0.8	10.8	4.3	6.5	13.8	90	16	27	17
With heatsink, 3-phase supply voltage 200 - 240 V ±10%, 0.12 - 2.2 kW										
ACS143-K75-1	0.37	A/0.8	3.2	2.2	3.3	7.1	90	6	13	14
ACS143-1K1-1	0.55	A/0.8	4.2	3.0	4.5	9.7	90	6	19	16
ACS143-1K6-1	0.75	B/1.1	5.3	4.3	6.5	13.8	90	6	27	17
ACS143-2K1-1	1.1	C/1.5	7.2	5.9	8.9	19.0	90	10	39	18
ACS143-2K7-1	1.5	C/1.5	8.9	7.0	10.5	23.5	95	10	48	19
ACS143-4K1-1	2.2	D/1.8	12.0	9.0	13.5	34.5	95	16	70	20
With heatsink, 3-phase supply voltage 380 - 480 V ±10%, 0.37 - 2.2 kW										
ACS143-K75-3	0.37	A/0.8	2.0	1.2	1.8	4.2	90	6	14	14
ACS143-1K1-3	0.55	A/0.8	2.8	1.7	2.6	5.6	90	6	20	16
ACS143-1K6-3	0.75	B/1.1	3.6	2.0	3.0	6.6	90	6	27	17
ACS143-2K1-3	1.1	C/1.1	4.8	2.8	4.2	9.2	90	6	39	18
ACS143-2K7-3	1.5	C/1.5	5.8	3.6	5.4	11.9	95	10	48	19
ACS143-4K1-3	2.2	D/1.8	7.9	4.9	7.4	16.3	95	10	70	20
Heatsinkless, 3-phase supply voltage 380 - 480 V ±10%, 0.37 - 2.2 kW										
ACS143-H75-3	0.37	H/0.8	2.0	1.2	1.8	4.2	90	6	14	14
ACS143-1H1-3	0.55	H/0.8	2.8	1.7	2.6	5.6	90	6	20	16
ACS143-1H6-3	0.75	H/0.8	3.6	2.0	3.0	6.6	90	6	27	17
ACS143-2H1-3	1.1	H/0.8	4.8	2.8	4.2	9.2	90	6	39	18

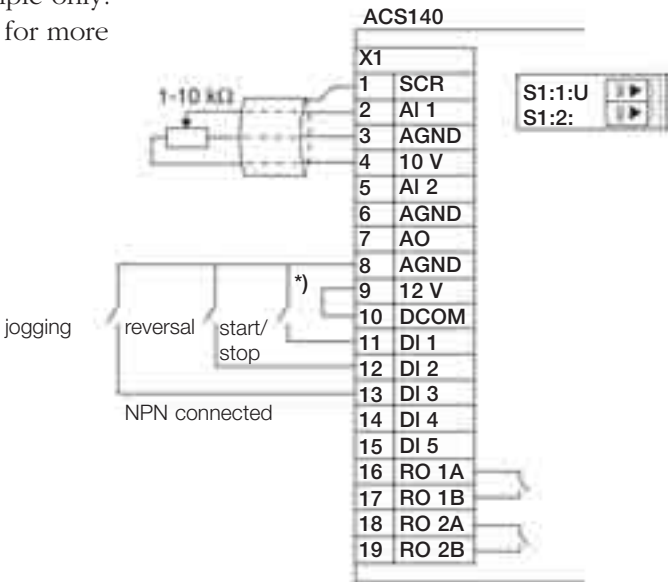
¹⁾ Fuse type: UL class CC or T. For non-UL installations IEC269 gG.

²⁾ P_N rated motor power. The power ratings in kW apply to most 2- and 4-pole IEC 34 motors. The current ratings are the same regardless of supply voltages. The rated current of the ACS140 drive must be higher than or equal to the rated motor current to achieve the rated motor power given in the table.

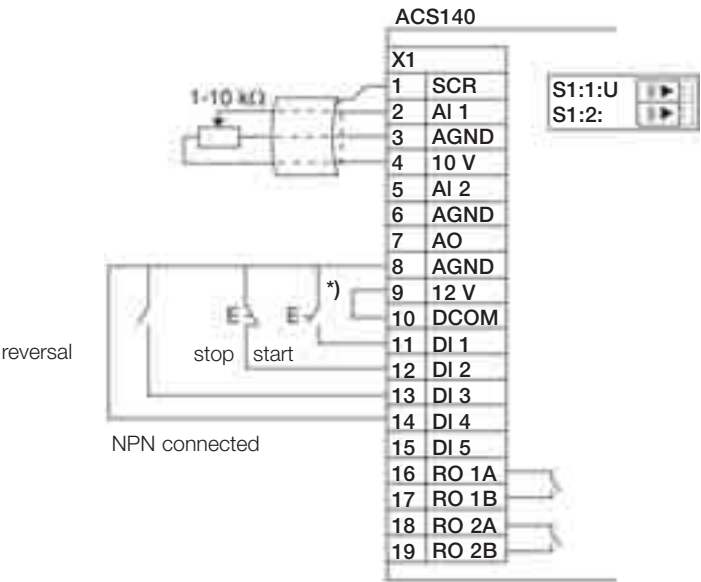
ACS140 connection examples

These connections are shown as an example only.
Please refer to the ACS140 User's Manual for more detailed information.

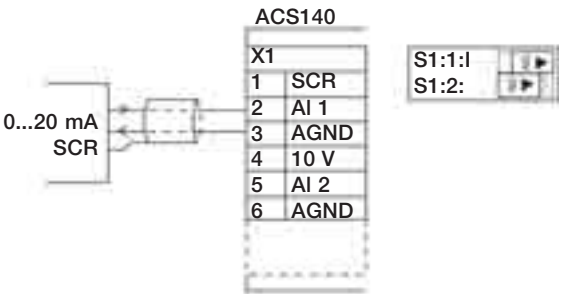
DI configuration default (0)



DI configuration default (1)

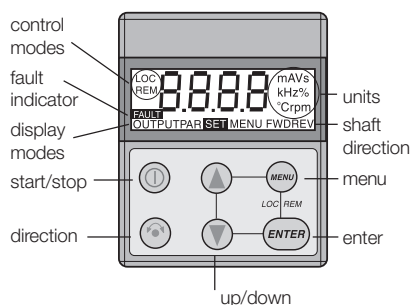


Frequency reference value from an external current source



*) If external voltages are used open the jumper X1: 9,10.
Use the DCOM and digital inputs.

ACS140 options



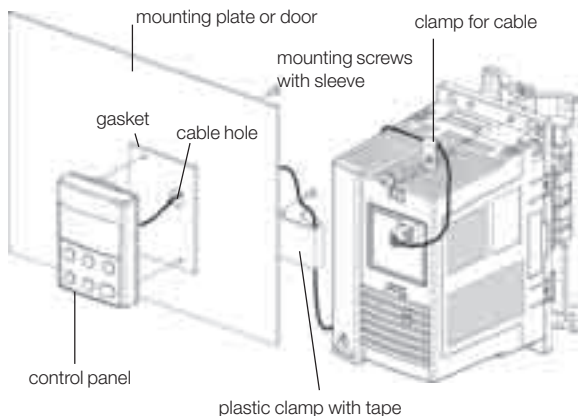
Control panel

Type code: ACS100 - PAN
ACS140 drives can be bought with or without a detachable control panel. If you prefer to buy the drive without the control panel we still offer you a chance to have the panel as an option. Using the control panel, parameters can be exchanged between two ACS140 drives. This is called parameter upload/download procedure.

Panel extension cable kit

Type code: PEC-98-0008

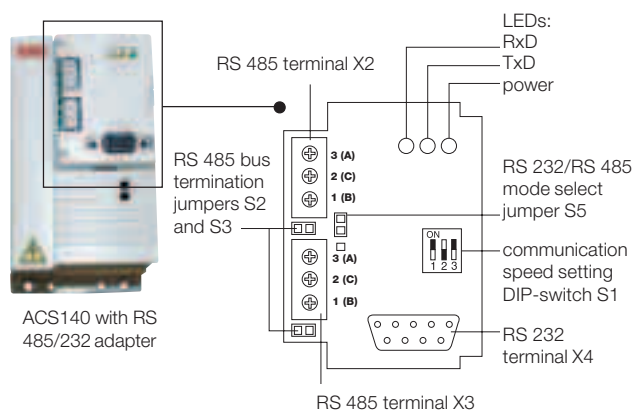
This option includes a gasket, a 3 m connection cable for control panels, fixing material for the cables and a drilling jig. With this kit IP 65 protection class is achieved.



RS 485/232 adapter

Type code: ACS140 RS 485/232

If you want to control the ACS140 drive via Modbus or use the DriveWindow Light 2 software you need to replace the panel with the RS 485/232 adapter. When the adapter is used, several ACS140 units can be controlled using Modbus protocol. The modbus communication also creates the base for controlling the drive via other gateways.



ABC fieldbus modules

Type codes: ABC-PDP and ABC-DEV

Up to ten drives can be controlled with one ABC fieldbus module. The drives may be of type ACS140 and/or ACS160. ABC modules are available for Profibus (type code ABC-PDP) and DeviceNet (type code ABC-DEV) fieldbus protocols. The module is DIN rail mountable with protection class IP 20. The ABC module requires 24 V DC power supply and provides an RS 485 Modbus interface for communication with the drives. The response time on the Modbus network is approximately 200 ms per drive.

ACS140 options

EMC filters

Instructions to comply with EN61800-3:

To comply with:

- **1st Environment, unrestricted** distribution, please contact your ABB distributor.
- **1st Environment, restricted** distribution, always use optional RFI filter as specified in the table below.

To comply with:

- **2nd Environment, unrestricted** distribution, always use optional RFI filter as specified in the table below.
- **2nd Environment, restricted** distribution, always use optional RFI filter as specified in the table below. If RFI filters are to be avoided, an EMC plan has to be created between the customer and the sales person.

1-phase supply voltage 200 - 240 V, 0.12 - 2.2 kW

Type code	Filter type	Max. motor cable length m						Dimensions			
		Switching frequency						A mm	B mm	C mm	D mm
		1 st environment			2 nd environment						
		4 kHz	8 kHz	16 kHz	4 kHz	8 kHz	16 kHz				
ACS141-K18-1, -H18-1	ACS100/140-IFAB-1	30	20	10	50	50	10	81	186	191	42
ACS141-K25-1, -H25-1	ACS100/140-IFAB-1	30	20	10	50	50	10	81	186	191	42
ACS141-K37-1, -H37-1	ACS100/140-IFAB-1	30	20	10	50	50	10	81	186	191	42
ACS141-K75-1, -H75-1	ACS100/140-IFAB-1	30	20	10	75	75	10	81	186	191	42
ACS141-1K1-1, -1H1-1	ACS100/140-IFAB-1	30	20	10	75	75	10	81	186	191	42
ACS141-1K6-1, -1H6-1	ACS100/140-IFAB-1	30	20	10	75	75	10	81	186	228	42
ACS141-2K1-1	ACS100/140-IFCD-1	30	20	10	75	75	10	81	286	211	42
ACS141-2K7-1	ACS100/140-IFCD-1	30	20	10	75	75	10	81	286	211	42
ACS141-4K1-1	ACS100/140-IFCD-1	30	20	10	75	75	10	81	286	218	42

3-phase supply voltage 380 - 480 V, 0.37 - 2.2 kW

Type code	Filter type	Max. motor cable length m						Dimensions			
		Switching frequency						A mm	B mm	C mm	D mm
		1 st environment			2 nd environment						
		4 kHz	8 kHz	16 kHz	4 kHz	8 kHz	16 kHz				
ACS143-K75-3, -H75-3	ACS140-IFAB-3	30	20	10	30	30	10	81	186	191	42
ACS143-1K1-3, -1H1-3	ACS140-IFAB-3	30	20	10	50	50	10	81	186	191	42
ACS143-1K6-3, -1H6-3	ACS140-IFAB-3	30	20	10	50	50	10	81	186	228	42
ACS143-2K1-3, -2H1-3	ACS140-IFAB-3	30	20	10	50	50	10	81	286	211	42
ACS143-2K7-3	ACS140-IFCD-3	30	20	10	50	50	10	81	286	211	42
ACS143-4K1-3	ACS140-IFCD-3	30	20	10	50	50	10	81	286	218	42

RFI filter type code ACS100 -FLT-C allows you to use longer motor cables. Please contact your ABB distributor. IFAB, IFCD and FLT-C filters with protection class IP 20.

Note! With types ACS...H mount the filter next to the drive.

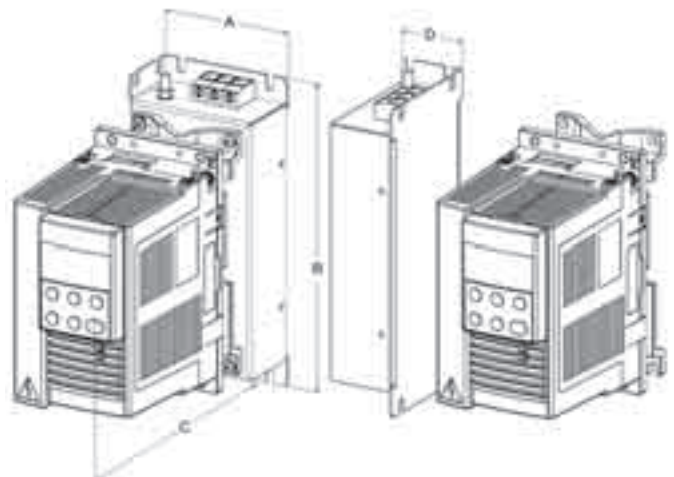
3-phase supply voltage 200 - 240 V, 0.37 - 2.2 kW

Use EMC filter type ACS140-FLT-C with all ACS143-xKx-1 converter types. Maximum motor cable length is 100 m in 1st Environment, restricted distribution, with 4 kHz and 8 kHz switching frequency. For ACS143-4K1-1 with EMC filter the maximum continuous load is 70% of nominal.

NEMA 1/ IP 21 installation kit

Type code: NEMA 1/ IP 21

With this installation kit NEMA 1/ IP 21 protection class is achieved for ACS140 and for the EMC filter, if the filter is attached directly to the drive.



ACS140 options

Input and output chokes

Output chokes are used when motor cables above normal length are required. The cable can be roughly 1.5 times the standard cable length. This is possible because the output choke reduces capacitive currents and voltage reflections. The maximum switching frequency with output chokes is 4 kHz. Please note your local EMC regulations.

Optional input chokes can be used with the ACS140 in case of a bad supply net. The chokes eliminate converter trips caused by overvoltage spikes. They also reduce line harmonics and therefore help to prevent other sensitive equipment in the same net from tripping.

Type code	Choke type		Max. motor cable length	
	Input choke	Output choke	with choke ¹⁾ m	without choke ¹⁾ m
1-phase supply voltage 200 - 240 V, 0.12 - 2.2 kW				
ACS141-K18-1	SACL21	ACS-CHK-B3	75	50
ACS141-K25-1	SACL21	ACS-CHK-B3	75	50
ACS141-K37-1	SACL21	ACS-CHK-B3	75	50
ACS141-K75-1	SACL21	ACS-CHK-B3	110	75
ACS141-1K1-1	SACL21	ACS-CHK-B3	110	75
ACS141-1K6-1	SACL22	ACS-CHK-B3	110	75
ACS141-2K1-1	SACL22	ACS-CHK-C3	110	75
ACS141-2K7-1	SACL23	ACS-CHK-C3	110	75
ACS141-4K1-1	SACL24	ACS-CHK-C3	110	75
3-phase supply voltage 200 - 240 V, 0.37 - 2.2 kW				
ACS143-K75-1	ACS-CHK-B3	ACS-CHK-B3	110	75
ACS143-1K1-1	ACS-CHK-B3	ACS-CHK-B3	110	75
ACS143-1K6-1	ACS-CHK-B3	ACS-CHK-B3	110	75
ACS143-2K1-1	ACS-CHK-B3	ACS-CHK-C3	110	75
ACS143-2K7-1	ACS-CHK-C3	ACS-CHK-C3	110	75
ACS143-4K1-1	ACS-CHK-C3	ACS-CHK-C3	110	75
1-phase supply voltage 200 - 240 V, 0.12 - 0.75 kW / heatsinkless				
ACS141-H18-1	SACL21	ACS-CHK-B3	75	50
ACS141-H25-1	SACL21	ACS-CHK-B3	75	50
ACS141-H37-1	SACL21	ACS-CHK-B3	75	50
ACS141-H75-1	SACL21	ACS-CHK-B3	110	75
ACS141-1H1-1	SACL21	ACS-CHK-C3	110	75
ACS141-1H6-1	SACL21	ACS-CHK-C3	110	75
3-phase supply voltage 380 - 480 V, 0.37 - 2.2 kW				
ACS143-K75-3	ACS-CHK-A3	ACS-CHK-B3	45	30
ACS143-1K1-3	ACS-CHK-A3	ACS-CHK-B3	75	50
ACS143-1K6-3	ACS-CHK-A3	ACS-CHK-B3	110 ²⁾	75
ACS143-2K1-3	ACS-CHK-B3	ACS-CHK-B3	110 ²⁾	75
ACS143-2K7-3	ACS-CHK-B3	ACS-CHK-C3	110 ²⁾	75
ACS143-4K1-3	ACS-CHK-C3	ACS-CHK-C3	110 ²⁾	75
3-phase supply voltage 380 - 480 V, 0.37 - 2.2 kW / heatsinkless				
ACS143-H75-3	ACS-CHK-A3	ACS-CHK-B3	45	30
ACS143-1H1-3	ACS-CHK-A3	ACS-CHK-B3	75	50
ACS143-1H6-3	ACS-CHK-A3	ACS-CHK-B3	110 ²⁾	75
ACS143-2H1-3	ACS-CHK-A3	ACS-CHK-B3	110 ²⁾	75

¹⁾ Without EMC filter

²⁾ If the supply voltage is higher or equal to 440 V the maximum cable length is 100 m.

Technical data

Choke type	L/mH	Dimensions H x W x D mm	Weight kg	Max. cable mm ²	I/A
ACS-CHK-A3	4.0	300x102x112	3.2	4	4.0
ACS-CHK-B3	1.5	300x102x112	4.0	4	8.0
ACS-CHK-C3	0.8	300x102x112	4.0	4	14.0
SACL21	3.2	76x63x62	1.0	4	8.5
SACL22	1.5	92x76x63	1.3	10	15
SACL23	0.7	92x76x63	1.3	10	22
SACL24	0.7	92x76x63	1.9	6	28

Brake options

The ACS140 can be equipped with a brake unit. For more information please refer to page 19 for the ACS140 brake options.

Brake options

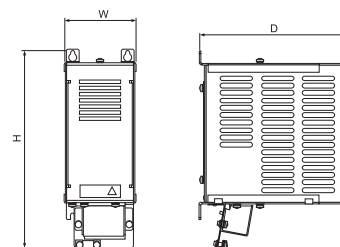
Brake units

Compact-sized brake units which include brake chopper and resistor, can be used with ACS100 and ACS140.

For more information please refer to the ACS-BRK Break Units Installation and Start-up Guide.

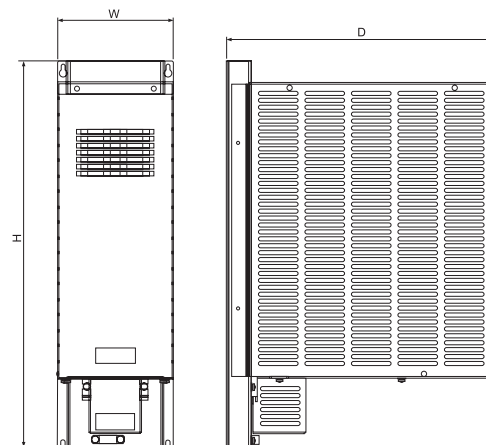
Brake units technical data

Brake unit type code	Frequency converter input voltage	Resistor OHM	Continuous output W	Max. output 20 s W
ACS-BRK-A	200 – 240 V AC 380 – 480 V AC	400	150	350 1000
ACS-BRK-B	200 – 240 V AC 380 – 480 V AC	150	400	1000 2400
ACS-BRK-C	200 – 240 V AC 380 – 480 V AC	32	2000	4500 12000
ACS-BRK-D	200 – 240 V AC 380 – 480 V AC	10.5	7000	14000 42000
ACS-BRK-E	200 – 240 V AC	4 –	5000	30000
ACS-BRK-F	200 – 240 V AC –	50	400	2400



Dimensions

Brake unit type code	Width mm	Height mm	Depth mm	Weight kg
ACS-BRK-A	90	240	180	1.2
ACS-BRK-B	90	300	285	1.5
ACS-BRK-C	150	500	347	7.5
ACS-BRK-D	270	600	450	20.5
ACS-BRK-E	270	600	450	18.5
ACS-BRK-F	90	300	285	1.5



Brake choppers

With a brake chopper the customer selects the resistor used. This ensures an optimum match between the equipment and the requirements.

Brake choppers technical data

Brake chopper type code	Frequency converter input voltage	Resistance OHM	Continuous output W	Max. output 20 s W
ACS-BRK-BL	200 - 240 V AC 380 - 480 V AC	150	400	1000 2400
ACS-BRK-CL	200 - 240 V AC 380 - 480 V AC	32	2000	4500 12000

Dimensions

Brake chopper type code	Width mm	Height mm	Depth mm
ACS-BRK-BL	93	250	75
ACS-BRK-CL	125	360	106.5

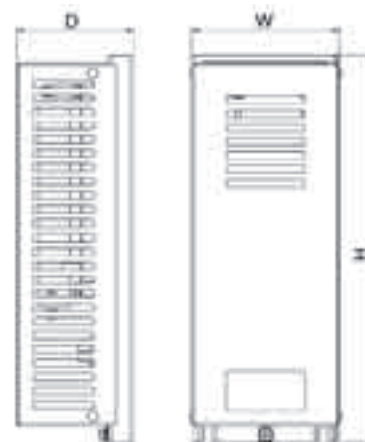


ABB decentralized drives, ACS160

0.55 kW - 2.2 kW supply voltage 380 - 480 V

Unique features

- Hard and tight aluminium IP 65 enclosure
- Can be installed in any position on the wall or on the motor
- When on the motor, no room or cabinet space is required
- Unit has built-in EMC filter and brake chopper
- Simple positioning tasks with Positioning application macro

More value for money

- Robust and vibration tested tight IP 65 enclosure with varnished electronic boards
- With the fieldbus options, can be part of every major industrial and domestic control system
- Squared torque current ratings and PID control macro for HVAC systems and applications
- In addition to ABB motors, compatibility with other manufacturers' motors

Motor mounting

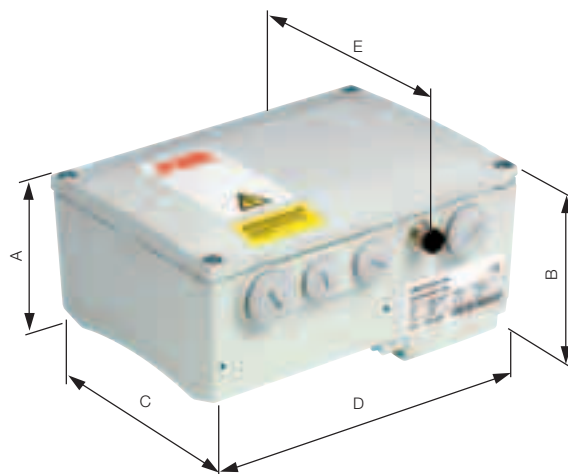
An excellent choice when a compact integrated drive is needed. Using an ACS160 it is easy to convert a fixed speed motor to regulated operation.

Wall mounting

A robust IP 65 drive in ABB's low voltage range of frequency converters. The control panel is included as standard.

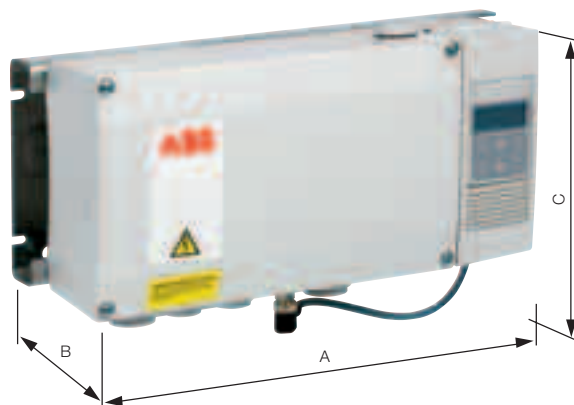
Dimensions of motor mounting unit

Type code	Frame size	A mm	B mm	C mm	D mm	E mm	Weight kg
ACS163-1K1-3-A...2K7-3-A	R1	99	112	157	221	171	3.9
ACS163-4K1-3-A	R2	99	112	157	261	171	4.6
ACS163-1K1-3-B...2K7-3-B	R1	135	149	157	221	171	5.5
ACS163-4K1-3-B	R2	135	149	157	261	171	6.3



Dimensions of wall mounting unit

Type code	Frame size	A mm	B mm	C mm	Weight kg
ACS163-1K1-3-D...2K7-3-D	R1	317	134	171	5.1
ACS163-4K1-3-D	R2	357	134	171	5.8
ACS163-1K1-3-E...2K7-3-E	R1	317	171	171	6.7
ACS163-4K1-3-E	R2	357	171	171	7.5



ACS160 technical specification

Mains connection

Power range: 0.55 - 2.2 kW

Voltage: 3-phase, 380 to 480 V $\pm 10\%$ ¹⁾

Frequency: 48 to 63 Hz

Power factor: 0.98

Motor connection

Voltage: 3-phase, from 0 to U_{supply}

Frequency: 0 to 250 Hz

Continuous loading capability (constant torque at maximum ambient temperature of 40°C):

- Rated output current I_{2N}

Overload capacity (at a max. ambient temperature of 40°C):

- At constant torque: $1.5 \cdot I_{2N}$ for one minute every 10 minutes
 - Starting torque: $1.8 \cdot I_{2N}$ for two seconds
- Characteristic data for short time, intermittent and periodic load cycles are available on request.

Switching frequency:

- Standard 4 kHz
- Low noise 8 kHz²⁾

Acceleration time: 0.1 to 1800 s

Deceleration time: 0.1 to 1800 s

Programmable control connections

Two analog inputs:

- Voltage signal: 0 (2) to 10 V, 200 k Ω single ended
- Current signal: 0 (4) to 20 mA, 500 Ω single ended
- Potentiometer reference: 10 V $\pm 2\%$ max. 10 mA, 1 k $\Omega \leq R \leq 10$ k Ω
- Response time: < 64 ms
- Resolution: 0.1%
- Accuracy: $\pm 1\%$

One analogue output: 0 (4) to 20 mA, load < 500 Ω

Auxiliary voltage: 24 V DC, max 180 mA

Five digital inputs: 12-24 V DC with internal or external supply, PNP and NPN logic

- Input impedance: 1.5 k Ω
- Response time: < 5 ms

Two relay outputs:

- Switching voltage: 12 to 250 V AC or max. 30 V DC / 0.5 A
- Max. continuous current: 10 mA to 2 A

Built-in brake chopper

Pulse encoder: Connected to digital inputs DI4 and DI5, max. 25 V DC / 100 mA, max. pulse frequency 200 kHz

Serial communication for external control:

- Modbus protocol as standard, other fieldbus options available: PROFIBUS-DP, InterBus-S, DeviceNet, CANopen, LONWORKS[®]

Programmable features²⁾

Nine application macros for easy configuration:

- Factory, ABB Standard, 3-Wire, Alternate, Motor Potentiometer, Hand-Auto, PID-Control, Pre-magnetize, Positioning

Skip frequencies: Two bands

Start and stop: Flying start, Torque boosting, Premagnetising function, DC hold function, DC injection braking

Functions:

- Output current and frequency limit, Programmable volts/hertz ratio, IR compensation, Slip compensation, PID-control with sleep function, Seven preset speeds, Automatic fault reset, Two acceleration and two deceleration ramps, Control for electromechanical brake

Protection

Limits

- Overcurrent trip limit: $3.5 \cdot I_{2N}$
- DC current regulation limit: $0.5 \dots 1.5 \cdot I_{2N}$
- DC overvoltage trip limit: 875 V
- DC undervoltage trip limit: 333 V
- Power-loss ride-through: 500 ms
- Overtemperature limit: 105°C inside power module

Inverter protection:

- Output short circuit, Input phase loss, Inverter overload, Output earth-fault, Serial communication error, Loss of AI signal, I/O terminal short circuit, Auxiliary voltage short circuit, Brake resistor overload

Motor protection:

- Stall protection, Overtemperature protection by P_t estimation; In motor mounting version also by PTC

Environmental limits

Ambient operating temperature³⁾:

- Output current = I_2 and $f_{\text{switch}} = 4$ kHz: -10 to 40°C
- Output current = $0.6 \cdot I_2$ and $f_{\text{switch}} = 4$ kHz: 40 to 50°C
- Output current = $0.7 \cdot I_2$ and $f_{\text{switch}} = 8$ kHz: -10 to 40°C
- Refer to page 31 for more derating information

Installation altitude:

- Output current = I_2 : 0 to 1000 m
- Output current reduced by 1% for every 100 m above 1000 m. Max altitude 2000 m.

Protection class: IP 65

Colour: NCS 1502-Y, RAL 9002, PMS 420 C

Contamination levels: According to IEC 721-3-3

Electromagnetic Compatibility (EMC):

- Units with built-in filter: Fulfills EN61800-3 1st and 2nd Environment distribution limits
- Standard units: Fulfills EN61800-3 2nd Environment restricted distribution limits
- Units without filter: For floating networks and to EN61800-3 2nd Environment with EMC plan.

Harmonic emissions:

- Units with < 1 kW input power fulfil EN61000-3-2
- Units with > 1 kW input power are to be used only in professional applications

Product compliance

- Low Voltage Directive 73/23/EEC with amendments
- EMC Directive 89/336/EEC with amendments
- Quality Assurance systems ISO 9001 and ISO 14001
- CE, UL, cUL and C-Tick approvals

¹⁾ For ACS163-xKx-3-D units 380 to 500 V $\pm 10\%$

²⁾ Adjustable only with control panel.

³⁾ Minimum ambient temperature for wall mounting version 0°C.

ACS160 technical data

0.55 kW - 2.2 kW supply voltage 380 - 480 V $\pm 10\%$

Type code	Nominal ratings								Over-current limit	Line fuse ⁵⁾ circuit A	Power losses	
	Nominal motor P _N ⁶⁾	Frame size/ weight	3~ supply voltage ±10%	Input current I _{1N} I _{2N} ¹⁾	Cont. output current I _{max} ²⁾	Max. current 150%	Max. starting current 180% ³⁾ I _{2NSQ} ^{1) 4) 6)}	Cont. output current (peak) A			Power circuit W	Control W
	kW	kg	V	A	A	A	A	A			A	A
Motor mounting version, standard												
ACS163-1K1-3-A	0.55	R1 / 3.9	380-480	1.6	1.8	2.7	3.2	2.2	7.1	4	17	16
ACS163-1K6-3-A	0.75	R1 / 3.9	380-480	2.2	2.4	3.6	4.3	2.8	9.5	4	23	17
ACS163-2K1-3-A	1.1	R1 / 3.9	380-480	3.2	3.4	5.1	6.1	3.8	13	6	33	18
ACS163-2K7-3-A	1.5	R1 / 3.9	380-480	4.1	4.1	6.2	7.4	5.0	16	10	45	19
ACS163-4K1-3-A	2.2	R2 / 4.6	380-480	6.0	5.4	8.1	9.7	6.6	21	10	66	20
Motor mounting version, with built-in filter												
ACS163-1K1-3-B	0.55	R1 / 5.5	380-480	1.6	1.8	2.7	3.2	2.2	7.1	4	17	18
ACS163-1K6-3-B	0.75	R1 / 5.5	380-480	2.2	2.4	3.6	4.3	2.8	9.5	4	23	19
ACS163-2K1-3-B	1.1	R1 / 5.5	380-480	3.2	3.4	5.1	6.1	3.8	13	6	33	20
ACS163-2K7-3-B	1.5	R1 / 5.5	380-480	4.1	4.1	6.2	7.4	5.0	16	10	45	21
ACS163-4K1-3-B	2.2	R2 / 6.3	380-480	6.0	5.4	8.1	9.7	6.6	21	10	66	22
Wall mounting version, filterless												
ACS163-1K1-3-D	0.55	R1 / 5.1	380-500	1.6	1.8	2.7	3.2	2.2	7.1	4	17	16
ACS163-1K6-3-D	0.75	R1 / 5.1	380-500	2.2	2.4	3.6	4.3	2.8	9.5	4	23	17
ACS163-2K1-3-D	1.1	R1 / 5.1	380-500	3.2	3.4	5.1	6.1	3.8	13	6	33	18
ACS163-2K7-3-D	1.5	R1 / 5.1	380-500	4.1	4.1	6.2	7.4	5.0	16	10	45	19
ACS163-4K1-3-D	2.2	R2 / 5.8	380-500	6.0	5.4	8.1	9.7	6.6	21	10	66	20
Wall mounting version, with built-in filter												
ACS163-1K1-3-E	0.55	R1 / 6.7	380-480	1.6	1.8	2.7	3.2	2.2	7.1	4	17	18
ACS163-1K6-3-E	0.75	R1 / 6.7	380-480	2.2	2.4	3.6	4.3	2.8	9.5	4	23	19
ACS163-2K1-3-E	1.1	R1 / 6.7	380-480	3.2	3.4	5.1	6.1	3.8	13	6	33	20
ACS163-2K7-3-E	1.5	R1 / 6.7	380-480	4.1	4.1	6.2	7.4	5.0	16	10	45	21
ACS163-4K1-3-E	2.2	R2 / 7.5	380-480	6.0	5.4	8.1	9.7	6.6	21	10	66	22

¹⁾ Power stages are designed for continuous I_{2N}/I_{2NSQ} current. These values apply at altitudes of less than 1000 m ASL. Current limits for squared torque are not valid if the ACS160 drive is used on top of a non ABB motor.

²⁾ 150% of nominal current I_{2N} allowed for one minute every 10 minutes.

³⁾ 180% of nominal current I_{2N} allowed for two seconds.

⁴⁾ No overloadability. Derate to 90% when using 8 kHz switching frequency. Rating is not valid if the ACS160 is installed on top of a non ABB motor.

⁵⁾ Fuse type: UL class CC or T. For non-UL installations IEC269gG.

⁶⁾ In squared torque applications use the values in column Cont. output current I_{2NSQ} to select the nominal motor power.

Use 60°C rated power cable (75°C if T_{amb} above 45°C).

Follow local rules for cable cross-sections. Shielded motor cable is recommended.

Max. wire sizes/Power terminals (mm²)

- single core: 4 (AWG 12), stranded:
2.5 (AWG 14)/torque 0.8 Nm

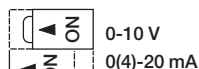
Max. wire sizes/Control terminals (mm²)

- 0.5-1.5 (AWG 22...AWG 16)/torque 0.4 Nm

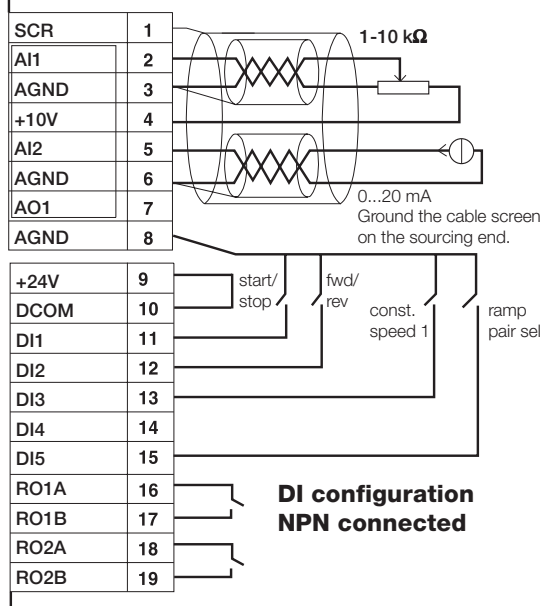
ACS160 connection examples

These connections are shown as examples only. Please refer to the ACS160 User's Manual for more detailed information.

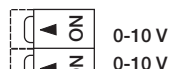
Analogue inputs



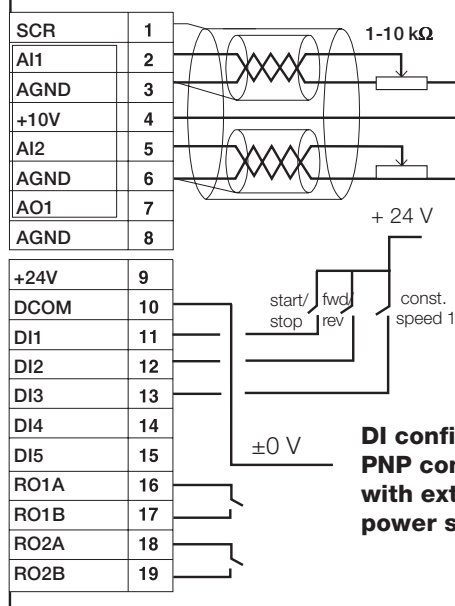
ACS160 X1



Analogue inputs



ACS160 X1



DI configuration PNP connected with external power supply

ACS160 electro magnetic compatibility

For floating networks or when EN61800-3 EMC standard is not required

In floating networks if the EN61800-3 EMC requirements do not need be fulfilled, the 163-xKx-3-D units can be used. The maximum motor cable length depends on the drive's input voltage and switching frequency.

With ACS163-xKx-3-D one can use output chokes to increase maximum motor cable length or input chokes to reduce problems caused by net voltage variation. Please refer to page 24 for more technical data about the chokes.

To fulfil EN61800-3 EMC requirements

If the EN61800-3 2nd Environment EMC requirements need to be fulfilled, the 163-xKx-3-A and 163-xKx-3-E units can be used.

If the EN61800-3 1st Environment EMC requirements need to be fulfilled, the 163-xKx-3-B and 163-xKx-3-E units can be used.

Motor cable lengths (m) to ensure accurate drive functionality

Wall mounting without EMC Filter Type code	Input voltage Switching frequency			
	400 V		500 V	
	4 kHz	8 kHz	4 kHz	8 kHz
ACS163-1K1-3-D	40	20	20	10
ACS163-1K6-3-D	60	20	20	10
ACS163-2K1-3-D	80	20	20	10
ACS163-2K7-3-D	90	50	40	30
ACS163-4K1-3-D	100	100	80	80

Selection table

Type code	Input choke	Output choke ¹⁾	Max. motor cable length m
ACS163-1K1-3-D	ACS-CHK-A3	ACS-CHK-B3	60
ACS163-1K6-3-D	ACS-CHK-A3	ACS-CHK-B3	80
ACS163-2K1-3-D	ACS-CHK-B3	ACS-CHK-B3	100
ACS163-2K7-3-D	ACS-CHK-B3	ACS-CHK-C3	120 ²⁾
ACS163-4K1-3-D	ACS-CHK-C3	ACS-CHK-C3	140 ²⁾

¹⁾ Supply voltage 380 - 480 V, switching frequency 4 kHz.

²⁾ If the supply voltage is higher or equal to 440 V the maximum cable length is 100 m.

Motor cable lengths (m) to comply with EN61800-3 2nd Environment restricted distribution

Type code	Input voltage 380-480 V $\pm 10\%$ Switching frequency	
	4 kHz	8 kHz
ACS163-1K1-3-E	30	20
ACS163-1K6-3-E	30	20
ACS163-2K1-3-E	30	20
ACS163-2K7-3-E	30	20
ACS163-4K1-3-E	55	40

Motor cable lengths (m) to comply with EN61800-3 1st Environment

Type code	Input voltage 380-480 V $\pm 10\%$ Switching frequency	
	4 kHz	8 kHz
	restricted/unrestricted distribution	restricted/unrestricted distribution
ACS163-1K1-3-E	10/5	10/5
ACS163-1K6-3-E	10/5	10/5
ACS163-2K1-3-E	10/5	10/5
ACS163-2K7-3-E	10/5	10/5
ACS163-4K1-3-E	10/5	10/5

ACS160 options

IP 65 Control panel kit

Type code: CA-PAN-L

ACS160 drives can be bought with or without a detachable control panel. In motor mounted units the control panel is offered as an option and in wall mounted units it is included automatically. Using the control panel, parameters can be exchanged between two ACS160 drives. This is called parameter upload/download procedure.



Fieldbus gateways and RS 485/232 adapter

Type code: see the table below

The ACS160 can be connected to all major automation systems with the help of the large variety of fieldbuses. The fieldbus gateways are available in robust IP 65 boxes, which can be conveniently fitted on one side of the drive. The Modbus protocol is as standard in all ACS160 units and can be used by means of an RS 485/232 adapter (CFB-RS).



Fieldbus technical data

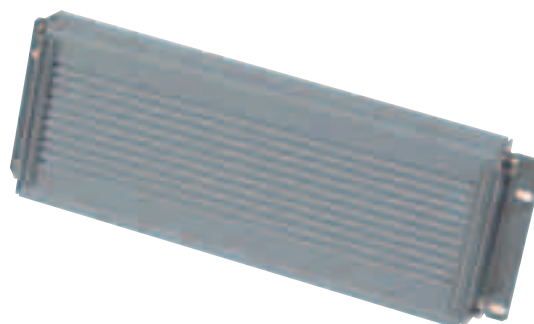
Fieldbus	Type code	Protocol mode	Device profile	Baudrate (min.-max.)
PROFIBUS	CFB-PDP	DP	Profidrive V.2	9.6 kbit/s - 12 Mbit/s
InterBus-S	CFB-IBS	PCP	Drivecom (Profile 21)	500 kbit/s
DeviceNet	CFB-DEV	N.A.	AC Drive profile	125 - 500 kbit/s
CANopen	CFB-CAN	N.A.	Drives and Motion control (DS402 V. 1.1)	10 - 1000 kbit/s
LONWORKS®	CFB-LON	LONTALK®	Variable Speed Motor Drive 6010	78 kbit/s
Modbus	CFB-RS	RTU	Profidrive	300 - 19200 bit/s

N.A. = Not applicable

ABC fieldbus modules

Type codes: ABC-PDP and ABC-DEV

Up to ten drives can be controlled with one ABC fieldbus module. The drives may be of type ACS140 and/or ACS160. ABC modules are available for Profibus (type code ABC-PDP) and DeviceNet (type code ABC-DEV) fieldbus protocols. The module is DIN rail mountable with protection class IP 20. The ABC module requires 24 V DC power supply and provides an RS 485 Modbus interface for communication with the drives. The response time on the Modbus network is appr. 200 ms per drive.



Integral brake resistors

Type code: see the table below

The ACS160 offers an optimal solution for braking, because brake choppers are built-in as a standard feature in all ACS160 drives. The IP 65 brake resistors can be fitted on one side of the ACS160.

Brake resistor technical data

ACS160 Type code	Type code	Resistance Ohm power W	Max. average resistor power W	Max. instantaneous
ACS163-1K1-3-X	CA-BRK-R1-1	390	39	700
ACS163-1K6-3-X	CA-BRK-R1-1	390	39	950
ACS163-2K1-3-X	CA-BRK-R1-2	125	39	1500
ACS163-2K7-3-X	CA-BRK-R1-2	125	39	2100
ACS163-4K1-3-X	CA-BRK-R2	125	45	3080

X stands for type code A, B, D or E

ACS160 options

Motor mounting kits

Type code: CMK-A-71 and CMK-A-80

Using a motor mounting kit, an ACS160 drive can be retrofitted on an existing fixed speed motor to convert it into an integral variable speed unit.



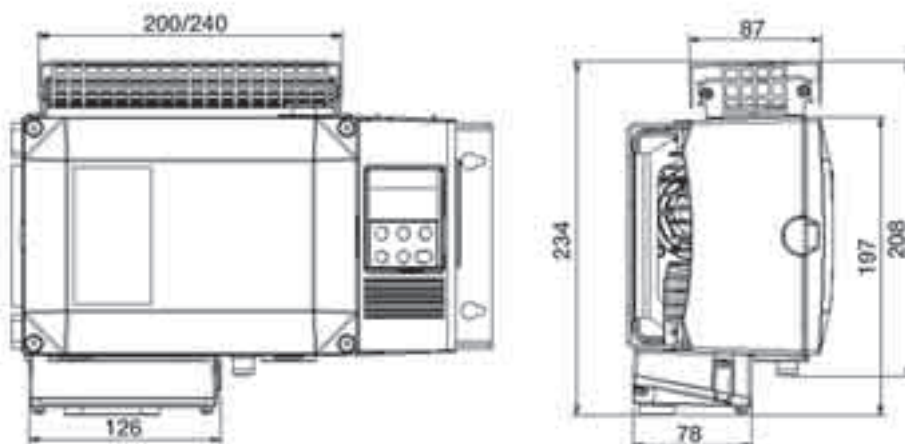
Cable gland set

Type code: CA-MGS

A selection of cable glands for ACS160 drives. The glands are for the following cable diameters: 5-9 mm (2 pcs), 6-12 mm (2 pcs) and 9-16 mm (2 pcs).



ACS160 Dimensions with fieldbus adapter and brake resistor attached



Start-up and maintenance tool

DriveWindow Light 2

DriveWindow Light 2

DriveWindow Light 2 is a set-up and control tool which is Win98, WinNT, Win2000 and WinXP compatible. DriveWindow Light 2 operates both off- and on-line. No additional PC hardware required. DriveWindow Light 2 uses the PC's RS 232 port and Modbus serial communication protocol. DriveWindow Light 2 is available also for some handheld computers.

ABB's DriveWindow Light 2 is an easy-to-use tool for the commissioning and controlling of drives. It provides even more flexibility and operating possibilities for ABB drives. It has features for programming, monitoring, trouble shooting and maintenance. It is also an excellent training tool. DriveWindow Light 2 operates with low voltage AC drive types ACS140, ACS160 and DC drive DCS 400.

The ACS140 drive has to be equipped with an ACS140 RS 485/232 adapter and the ACS160 has to be equipped with the CFB-RS adapter when DriveWindow Light 2 is used.

DriveWindow Light 2 features

- Off- and on-line viewing and changing of drive parameters.
- Backup and restore parameters. In a fault situation the parameters can be reloaded resulting in time savings.
- Graphical monitoring of actual signal values.
- I/O mapping table
- Controlling of the drive



Contact and web information

ABB's worldwide presence is built on strong local companies working together with the local distributor and channel partner network across borders to achieve a uniform level of services for all our customers. By combining the experience and know-how gained in local and global markets, we ensure that our customers in all industries can gain the full benefit from our products.

For further details about all our variable speed drive products and services please contact your nearest ABB drives channel partner or visit the ABB website www.abb.com/motors&drives.

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